

CLAIMS

1. A vehicle impact energy absorbing member comprising a compression energy absorbing member using compression deformation and a buckling energy absorbing member using buckling deformation, wherein impact energy applied to a vehicle body is absorbed by a combination of the two energy absorbing members.
2. The vehicle impact energy absorbing member according to claim 1, wherein the compression energy absorbing member and the buckling energy absorbing member start energy absorbing deformation under an impact force by substantially the same timing.
3. The vehicle impact energy absorbing member according to claim 1, wherein the compression energy absorbing member and the buckling energy absorbing member start energy absorbing deformation under an impact force by different timings.
4. The vehicle impact energy absorbing member according to claim 1, wherein a setting is made such that the impact force on the two energy absorbing members is generally constant over the entire length of the time period during which the impact energy is absorbed by the two energy absorbing members.
5. The vehicle impact energy absorbing member according to claim 1 or 4, wherein the compression energy absorbing member is disposed so as to be compression-deformed over the entire length of the impact energy absorption time period, and the buckling energy absorbing member is disposed so as to be buckled and deformed in an initial stage in the impact energy absorption time period.

6. The vehicle impact energy absorbing member according to any one of claims 1 to 5, wherein the compression energy absorbing member is constituted by a foamed molded piece made of a synthetic resin.

7. The vehicle impact energy absorbing member according to claim 6, wherein the foaming expansion ratio of the foamed molded piece forming the compression energy absorbing member is set to 2 to 150.

8. The vehicle impact energy absorbing member according to any one of claims 1 to 7, wherein the buckling energy absorbing member is constituted by a solid member made of a synthetic resin material.

9. The vehicle impact energy absorbing member according to any one of claims 1 to 8, wherein the buckling energy absorbing member is constituted by a foamed molded piece made of a synthetic resin material.

10. The vehicle impact energy absorbing member according to claim 9, wherein the foaming expansion ratio of the foamed molded piece forming the buckling energy absorbing member is set to 20 or less.

11. The vehicle impact energy absorbing member according to any one of claims 1 to 10, wherein buckling allowance spaces are provided on opposite sides of the buckling energy absorbing member.

12. The vehicle impact energy absorbing member according to any one of claims 1 to 11, wherein the buckling energy absorbing member is formed integrally with the compression energy absorbing member by insert molding.

13. The vehicle impact energy absorbing member according to

any one of claims 1 to 12, wherein the buckling energy absorbing member and the compression energy absorbing member are separately formed and combined integrally with each other.

14. The vehicle impact energy absorbing member according to any one of claims 1 to 13, wherein the vehicle impact energy absorbing member is a core member of a vehicle bumper.

15. The vehicle impact energy absorbing member according to claim 4, wherein the buckling energy absorbing member is provided through the entire width of the bumper in the front-rear direction.

16. The vehicle impact energy absorbing member according to claim 14 or 15, wherein the buckling energy absorbing member is constituted by a member in the form of a plate made of a synthetic resin material and is provided in a substantially horizontal plane along the lengthwise direction of the bumper and through the entire width of the bumper in the front-rear direction.

17. The vehicle impact energy absorbing member according to any one of claims 14 to 16, wherein the buckling energy absorbing member is provided integrally with a bumper facer, and an assembly space for accommodating the buckling energy absorbing member is formed in the compression energy absorbing member.

18. A vehicle impact energy absorbing member comprising a buckling energy absorbing portion which has a buckling characteristic such that a peak value of impact force is equal to or smaller than a set value and in which a setting is made such that at least one of impact timing for starting absorption of impact energy and peak value timing for making

the impact force have a peak value after collision is changed in a stepping manner or continuously, wherein impact energy applied to a vehicle body is absorbed by buckling deformation of the buckling energy absorbing portion.

19. The vehicle impact energy absorbing member according to claim 18, wherein a plurality of buckling energy absorbing portions are independently provided in such a combination that the buckling energy absorption portions differ at least in the impact timing and the peak value timing, and the plurality of buckling energy absorbing portions are buckled and deformed in a stepping manner or continuously to absorb the impact energy.

20. The vehicle impact energy absorbing member according to claim 18 or 19, wherein a buckling energy absorbing portion in which a difference is caused at least in one of the impact timing and the peak value timing is integrally provided, and the integral buckling energy absorbing portion is buckled and deformed in a stepping manner or continuously to absorb the impact energy.

21. The vehicle impact energy absorbing member according to any one of claims 18 to 20, wherein the height of the buckling energy absorbing portion is varied to make a setting such that at least one of the impact timing and the peak value timing is changed.

22. The vehicle impact energy absorbing member according to any one of claims 18 to 21, wherein the thickness of the buckling energy absorbing portion is varied to make a setting such that the peak value timing is changed.

23. The vehicle impact energy absorbing member according to any one of claims 18 to 22, wherein the width of the buckling

energy absorbing portion is varied to make a setting such that the peak value timing is changed.

24. The vehicle impact energy absorbing member according to any one of claims 18 to 23, wherein the arrangement density of the buckling energy absorbing portion is varied to make a setting such that the peak value timing is changed.

25. The vehicle impact energy absorbing member according to any one of claims 18 to 24, wherein the sectional shape of the buckling energy absorbing portion is varied to make a setting such that the peak value timing is changed.

26. The vehicle impact energy absorbing member according to any one of claims 18 to 25, wherein the buckling energy absorbing portion is constituted by a solid member made of a synthetic resin material.

27. The vehicle impact energy absorbing member according to claim 26, wherein the buckling energy absorbing portion is integrally formed on a member on the vehicle side.

28. The vehicle impact energy absorbing member according to any one of claims 18 to 27, wherein the buckling energy absorbing portion is constituted by a foamed molded piece made of a synthetic resin material.

29. The vehicle impact energy absorbing member according to any one of claims 18 to 28, wherein the buckling energy absorbing portion comprises a buckling energy absorbing portion constituted by a solid member made of a synthetic resin material and a buckling energy absorbing member constituted by a foamed molded piece made of a synthetic resin material.

30. The vehicle impact energy absorbing member according to

claim 28 or 29, wherein the foaming expansion ratio of the buckling energy absorbing portion is varied to make a setting such that the peak value timing is changed.

31. The vehicle impact energy absorbing member according to any one of claims 28 to 30, wherein the foaming expansion ratio of the foamed molded piece constituting the buckling energy absorbing portion is set to 45 or lower.

32. The vehicle impact energy absorbing member according to any one of claims 18 to 31, wherein buckling allowance spaces are provided on opposite sides of the buckling energy absorbing member.

33. The vehicle impact energy absorbing member according to claim 1, wherein the buckling energy absorbing member in the vehicle impact energy absorbing member according to claim 1 is the vehicle impact energy absorbing member according to any one of claims 18 to 32.

34. A vehicle impact energy absorbing structure comprising the vehicle impact energy absorbing member according to any one of claims 1 to 33, the vehicle impact energy absorbing member being provided in a space between a bumper reinforcing member provided in a front end portion of a vehicle along the vehicle width direction and a bumper facer covering the bumper reinforcing member.

35. A vehicle impact energy absorbing structure comprising the vehicle impact energy absorbing member according to any one of claims 1 to 13, and 18 to 33, the vehicle impact energy absorbing member being provided in a space between a door inner panel and a door trim.

36. A vehicle impact energy absorbing structure comprising

the vehicle impact energy absorbing member according to any one of claims 1 to 13, and 18 to 33, the vehicle impact energy absorbing member being provided in a space between a pillar inner panel and a pillar trim.